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Nomadic Knowledge of the Yak: A Case Study in the Khangai Mountains, Mongolia

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Abstract

It is extremely important to probe and preserve the knowledge of nomadic herders of Mongolia. There is no formal piece of literature that dictates how these clever humans survive. Their lifestyle requires a vast skill set spanning from construction knowledge, to navigational skills, to a deep understanding of their animals. One attains this knowledge through years of observation, listening, and attempting to mimic their parents. In this way, knowledge is passed on from one generation to the next. Investigating herder's knowledge of the yak provides a window into the animal husbandry practices of Mongolian nomads. The herders in the central Khangai Mountains of Mongolia rely heavily on the yak for milk, meat, rope, and labor. Herders select and breed these animals based on an informal set of criteria. Bulls used to breed these animals are not selected for one specific trait; for example to produce the most milk possible. Instead the bulls are selected based on a multitude of traits, because herders' use of the yak is based less on profit, and more on subsistence. Through examination of the yak and the oral history surrounding it, underlying connections between herders and their animals can be realized.

Introduction

The Mongolian yak descended from wild yaks living in the pine tundra and cold desert regions of the Tibetan Plateau. These animals were domesticated by the Qiang People who resided in Northern Tibet. Little is known about the exact timing of domestication, but scholars believe it occurred in the late stone age around 10 thousand years ago (Wiener 2003). Several pieces of artwork dating to the second

century provide strong evidence that the yak was being used for labor at this time in Tibet. A fresco found in the Sakya Monastery constructed in 1073 AD depicts 13,000 laborers and a train of yaks carrying loads during the construction of a monastery. A monastery in Northern Nepal constructed in 1694 AD houses a mural displaying horses, camels, and two yaks transporting heavy loads (Olsen 1990). This provides strong evidence for the use of yaks in construction projects during the second century.

The use of domesticated yaks expanded northward from the Tibetan Plateau through the Kunlun, Tianshan, and Altai mountains eventually reaching Mongolia. Determining the exact timing of this migration from the current evidence is purely speculative. Regardless, as of 2003 there were 400 thousand yaks residing in Mongolia the vast majority found in the Khangai and Khovsgol mountains. Mongolia has the second largest population of domesticated yaks on earth, behind China where almost 12 million yaks reside (Wiener 2003).

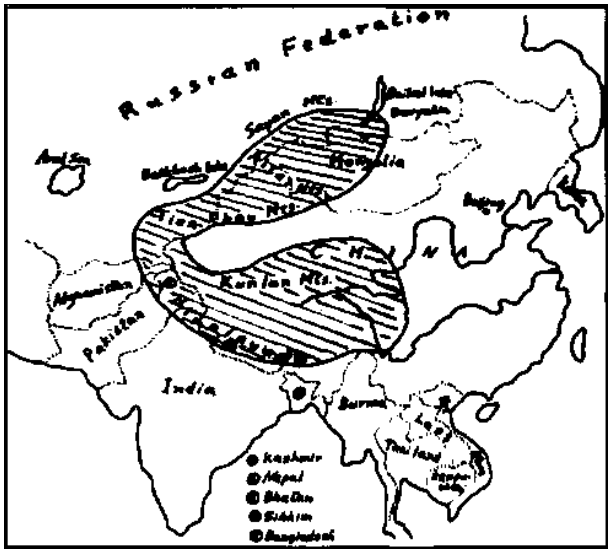

Figure 1: Present distribution of the domesticated yak (Wiener 2003)

The history of herding animals is rooted deeply in the past of Mongolia. In the “Blue Cave” of the western Khovd Aimag, archaeologists have found a bull skull from a temporary dwelling site dated to 750 thousand years ago. This may not prove that people were herding animals, that far into the past, but they certainly were interacting with them, perhaps hunting or attempting to domesticate them. Several depictions of bulls and castrated ox have been found throughout Mongolia, dating to the Bronze Age spanning from 3300 to1200 BC (S. Dulam). As of 2002, one-third of all households receive there primary income from the herding of livestock (Shagdar 2002). This tradition of the nomadic lifestyle is deeply rooted in the culture of Mongolia. Herders live with their animals almost every day of the year, caring for them, and driving them to new pastures.

In Mongolia there are 5 main animals raised: sheep, goats, horses, camels and cattle. There are two types of cattle, the yak and the Mongolian cattle. The yak is better suited to an alpine environment than the more widely used Mongolian cattle. The domestic yak usually resides in altitudes of around 2000 meters above sea level and rarely below 1700 meters (Olsen 1990). The yak has evolved to live in the harsh climate of these environments. With its dense wool, thick hide, and compact body the yak is highly resistant to cold weather. During winter months the down fiber of the coat gets coarser, and the thick layer of fat from grazing in the summer and fall acts as an insulating layer to keep the yak warm (Wiener 2003). Mongolian yaks are predominantly black, brown, or black and white in color.

The goal of this research is to document the nomadic knowledge of the yak. This includes the yak products and there utilization, the oral history, and the system

used to breed and select these animals. Through this I hope to gain insight into the cultural significance of the yak.

Methods

The data for this research was collected through interviews, and a survey of the existing literature surrounding my topic. The majority of my data was gathered through interviews of nomadic herders in two separate locations. The first location was Galuut Sum in the northern portion of Bayankhongor Aimag. I spent two weeks living in a felt yert, or *ger* with a family of nomadic herders. During this time I made observations about herding, and utilization of yaks. I also conducted 2 interviews through a translator, with my host father inquiring into his family's use of yaks. This area is characterized by open steppe valleys, surrounded by the rolling peaks of the Khangai Mountains. Forested areas are only found on the highest elevations of the mountains. Bayankhongor receives an average of 200 mm of precipitation per year (Fernandez-Gimenez 1999).

My second field location was located in Bulgon Sum, Arkhangai Aimag. Here I lived in an *ail*, (a camp of several families who herd animals together) for 10 days. During the day I traveled on horseback, along with a translator, guide, and my fellow researcher Kayla, to 12 separate herding families to conduct interviews. The interviewees were given an informant consent form explaining my research topic prior to asking them questions. To retain their privacy, their names will not be mentioned, except to give credit to the stories that are displayed later in the text. This environment was characterized by mountain pastures lying between dense deciduous and coniferous forested areas. Water was also plentiful, with streams

running throughout the valleys. These two field sites were selected because of their accessibility from Ulaanbaatar and because the residents of both of these areas herd almost exclusively yaks, not Mongolian cattle.

I also interviewed scholars from the Agriculture University of Mongolia and National University of Mongolia in Ulaanbaatar. All of my interviews required the use of a translator. Through this type of research there are limitations on the accuracy of data collected. The use of another person creates another layer of interpretation that could detract from the accuracy of the results. In order to attain as original results as possible, all points were clarified during interviews. Another limitation was the timeframe of research. In order to get a full perspective on the nomadic use of yaks, one would need to observe their activities for at least an entire year. Interviews give accurate glimpses into nomadic culture, but can not capture the true nature of the seasonal shifts in the system.

Utilization of the Yak

For nomads residing in the mountainous regions of Mongolia, the yak plays a vital role in their subsistence. The thick hide and warm wool of the yak is used to make rope, a tool used in many facets of a herder's lifestyle. Yak products contribute highly to the meat and dairy rich diet of nomads. These brawny bovines also carry massive loads of cargo during the frequent moves from one camp to the next. In order to understand the importance of the yak, these must be examined.

Rope

The process rope making begins when the animals are slaughtered in the heart of the Mongolian winter, in November or December. Through my interviews

in the Arkhangai region I discovered two different ways that herders kill their cattle. The first technique involves swiftly striking a yak's forehead with the blunt end of an axe. First the animal's legs are bound by two short ropes (each about 3 ft in length), one for the front and one for the hind legs. Before tying, each rope is wrapped in a figure eight pattern around the two legs it's responsible for restraining. With enough force applied directly to the forehead, the yak will die after just one axe swing. This task requires strength and skill, and even experienced herders will occasionally need more than one swing to kill a full-grown yak. One herder showed me the axe used for this process. It was about 30 inches in length and weighed between 4 and 5 pounds.

The second technique involves the same tying process. Then a knife is used to sever the connection between the brain and spinal chord. This involves stabbing into the animal on the neck just below the skull, and then moving the knife back and forth.

After the animal is killed, the jugular vein in the neck is severed and the blood is drained into a pale. Just as almost every other part of the body, this blood will be used in some fashion. This process will be explained in the next section. Now to separate the hide from the body, an incision is made from the neck to the middle of the belly, just deep enough to penetrate the hide, but not the inner tissue. After initially peeling open the hide near the belly, a herder can insert their fists between the outer skin and the connective tissue. Holding the hide taught with one hand, the herder forces his clenched fist in between the two membranes. Working outward from a central point he moves around the belly to the back, up towards the

neck, and down to the hindquarters. By using fists there is no risk of ripping the inner tissue. Then incisions are made around each of the legs and the hide is removed from the body. Next a razor or small knife is used to remove the yak hair from the hide. This involves scraping up and down; shaving off the thick hair, while avoiding slicing into the hide.

Then the hide is cut into thin strips, coiled and left in a shaded area for several months. The strips are cut 1 inch thick and the length of 12 *alts*. An *alt* is a Mongolian measuring unit equivalent to the average human wingspan. 12 *alt* is considered 1 rope, and one yak hide will produce about three ropes, after the entire process is completed.

In the spring and summer, herders begin a process to turn the stiff hide into pliable rope. This involves hanging the rope, and working it up and down with piece of wood. First the rawhide must be moistened. Some herders will soak the rawhide overnight. One particular family told me they soak the hide overnight in a slurry of water, sheep and goat feces. Using only water would over saturate the hide, compromising the strength of the finished product, but when mixed with animal feces it allows the rawhide to reach the desired saturation level. Some herders will use animal fat to moisten the hide. Marmot oil is preferred because it deeply penetrates the pores of the hide. Regardless of the specific technique used, the hide must be wet prior to working the hide.

Next the hide is hung using several different techniques. Some herders will place a piece of wood between the main support beams of the *ger* letting the rope hang down. Others will hang the hide from three logs jutting upwards and coming

together at a single point, forming a cone about eight feet high. Then a weight is attached to the bottom of the hide and spun, coiling the hide. Next a rounded piece of wood (about the length and thickness of a human arm) is used to work the rope from the top to the bottom, and then back up again (Figure 2). Then the hide is coiled again and the process is repeated over and over.

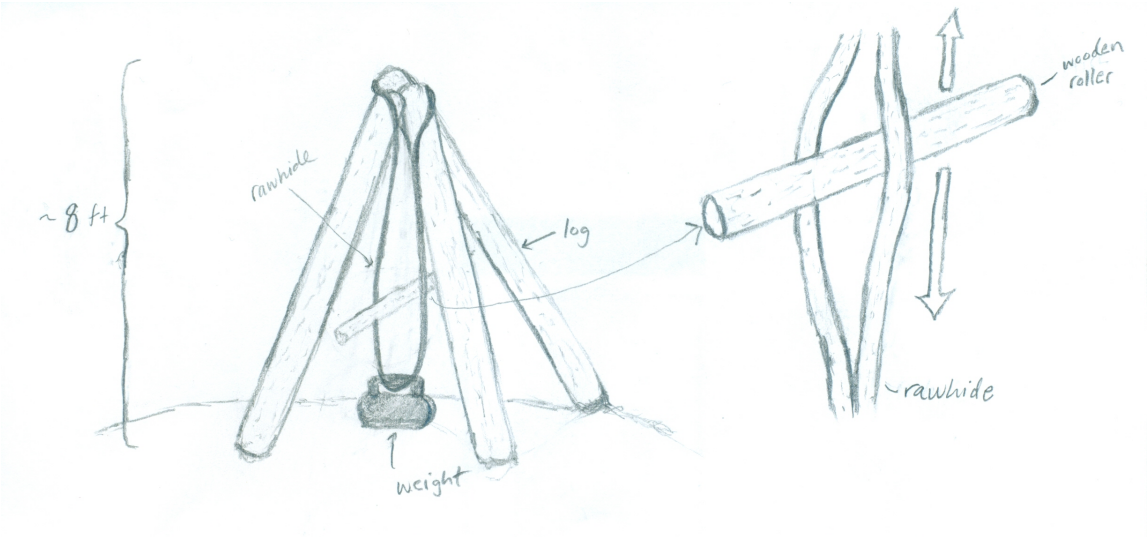

Figure 2: Diagram of method used by herders to hang rope and work it with a wooden roller when tanning hides.

It takes the better part of a day to work 12 *alt* of stiff hide into finished rope. After this process is completed the rope is ready to be used for a variety of things. According to the herders interviewed, yak hide is thicker and produces a stronger rope than that of Mongolian cattle. This rope is a crucial tool for a nomadic lifestyle. In Arkhangai, where timber is plentiful, ropes are used to secure large logs onto carts used to transport wood back to camp. It's also used extensively in the construction of horse tack including leads, bridles, and saddles. Often rawhide, which hasn't been worked, is used on saddles where stiffer material is preferred.

Rope is also used to secure loads onto carts during seasonal camp movements. It can also be found inside, holding together the crosshatchings that provide the inner structure for *ger.*

The long hair that hangs from the chests of the yaks is also removed and braided into rope. These ropes wrap all the way around the *ger*, keeping the felt covering tightly bound to the crosshatchings. In every *ger* that I visited, there were 2 ropes on the inside and 3 on the outside.

Meat

In Arkhangai and Bayankhongor the yak contributes highly to the meat and diary intensive diet of nomadic herders. As previously mentioned, yaks are slaughtered in the winter months, because there is no risk of spoilage. Yaks are usually killed at the age of 4 or 5 once they have reached full maturity. After removing the hide and collecting the blood, the body is cut into 6 main parts: the neck, the back and spine, 2 shoulder and rib pieces, and the 2 hind legs or in The frozen meat is stored in a smaller *ger*, or shed, usually without any type of containment. During the winter and early spring, meat is thawed, chopped, and prepared in Mongolian meals like *buuz*, or *tsuivan*. This meat is the staple of the Mongolian diet during winter and early spring.

Nomadic herders also prepare a type of meat called *borts*, for consumption during the rest of the year. From the previously mentioned cuts of meat, some is sliced away from the bone immediately after the animal is slaughtered. The meat is cut into strips (1 inch thick and 6 inches long) and then hung by a string, often between the *un*, which are the support beams of the *ger*. It takes about two months

before the meat is fully dried and ready to eat. This method of meat preparation allows herders to go without any type of refrigeration during the warm months of the year.

The blood of the slaughtered yaks is also often added for flavoring in Mongolian dishes. The blood is boiled and then placed into a container, often a sheep or yak stomach, and then left in a cold place. Even the leg from the calf down is used for consumption. After the hooves are removed and the hair is burned away, the leg is boiled and eaten.

Meat also provides some income for herders. Livestock can either be sold alive, or butchered. Middle men will visit the herders during the winter months purchasing meat and livestock and bringing it to larger markets.

Dairy

Dairy products are extremely important in the Mongolian diet, and the yak contributes greatly to this. Besides plain milk, herders drink almost exclusively milk tea- a mixture of milk and water, brewed with special tea leaves. From yak's milk, they also make cream, yogurt, dried curd, oil, and even an alcoholic beverage that's often referred to as "Mongolian vodka". Yaks produce much richer milk than Mongolian cattle, and this milk was preferred by the herders in both Bayankhongor and Arkhangai.

Yaks are milked for 9 months every year. During the harsh winter the yaks need the extra energy, especially if they are calving, so herders generally won't milk during these times. To preserve milk for this time of year, it is stored in tightly sewn goat or sheep stomachs and stored in a dry place. Throughout the spring and

fall the average yak cow produces 1 liter of milk every day, while a Mongolian cow will produce 1.5 liters of milk. In the summer, its 2 liters from every yak compared with 2.5 to 3 liters from a Mongolian cow. In the winter month's cows of all cattle types produce significantly less milk, often hardly any at all in November and December. A *haineg*, which is a crossbreed of yaks and Mongolian cattle, will produce more milk than either of its parents- 2 liters in the fall and spring and 3 liters in the summer. Similar to Mongolian milk in thickness, the *haineg* milk is not nearly as rich as the yaks.

During my 10 day stay near Bulgon Sum in Arkhangai Aimag, I would often observe the morning milking routine. At night all the mother cows and calves were kept in a corral. This corral was divided into a main area, housing the cows, and two smaller pens, one with the 1-year old calves, and another with the 2- year old calves. In the morning the cows were milked by two women living in the *ail* I was staying at. After they were done milking a cow, they would bring the calf to its mother, allowing it to suckle. This process was repeated until all the cows had been milked.

A cow will only produce milk if it is calving. Therefore when a calf dies, another calf, one that already has a mother will be used to stimulate the cow to produce milk. Cows are very particular about who they allow to enjoy their milk. Therefore some methods have to be employed to get a mother to accept a calf who is not their own. Herders will tie them together during the morning milking, forcing them to be in close quarters regardless of the discomfort of the mother, who will often butt the calf with its large head knocking it to the ground. They will also use a

special salty powder called *mara*. The salt is forced under the nose of the cow, sprinkled on the calf's body, and then the cow's nose is forced into calf's wool, while it reaches for its new mother's teats. By repeating this process during the morning milking the cow becomes accustomed to the smell, allowing the calf to suckle, without butting or kicking.

The calves are born between April and June every spring, and they will suckle for about a year. If a cow is going to give birth to a new calf in the following spring, herders will wean the existing calf off of its mother's milk in the winter. This ensures that the cow has enough energy to produce quality milk in the spring. The simplest way to wean a calf is to herd them into separate pastures during the day, and keep them in separate pens at night. This usually works, but sometimes there will be a determined calf who, despite the efforts of the herder, will find its way back to its mother's teat. Often this occurs with calves that have two mothers from the previously mentioned scenario, where a cow loses its mother and calf is forced to suckle from two mothers to stimulate milk production. In this case, the calf's nose is pierced, and a piece of wood or metal is slipped through the hole. From this, a piece of metal is connected and extends partially over the calf's mouth. This allows the calf to eat grass normally, but prevents them from putting their mouth around their mother's teat. Figure

Transportation and Work

The herders of Mongolia live a nomadic lifestyle, which requires them to be mobile. Almost every herder that I interviewed moved at least 4 times over the coarse of the year. During these moves they transport everything that they need to

survive including *gers*, heavy tools, food, and saddles. To achieve this they utilize yaks as their main mode of transportation. Some herder's have access to cars that aid in the moving process. Some use horses for light loads, but the main method for transporting materials from one camp to the next amongst the herders I interviewed, was the yak. For this job castrated males, in Mongolian referred to as *shar*, from the ages of 4 and older are used. Loads of materials are either secured by rope, or the animal pulls a wooden cart. The average *shar* can carry between 200 and 250 kg in a single load. One herder in Galuut Sum told me that the experienced animals can carry 3 loads in a day, without any guidance. After bringing the yak to the new camp once, they know the way, and will go back and forth carrying more supplies.

The process of training for yaks is fairly simple. When they are 2 -3 years old their noses are pierced and a rope is fitted through the hole. For this particular job, the herders in Arkhangai preferred rope made of yak hair, because of its strength and pliability. This rope gives herders control over the animal when they are riding them. They are ridden bareback or with a Mongolian horse saddle allowing the animals to experience weight on their backs, and teaching them to respond to directional pulls from the rope. After riding them on a regular basis for a few weeks, then they will attach them to carts, directing them while they pull heavy loads.

Besides carrying loads during movement from camp to camp, yaks are also used in everyday activities. *Hainegs* are also used, because they are excellent for labor intensive jobs.

Several of the herding families that I visited had 1 or 2 *hainnegs*. On one occasion I observed a *hainneg* being used to pull a cart stacked high with wood back to the camp. The *hainneg* pulled the cart through muddy, bumpy terrain while the herder rode on its back. For a short time, me and my two other companions sat next to the four massive logs to ride through a large puddle.

Every herder that I encountered told me that they herd their animals all year round, even through the harshest weather. In the winter the temperatures in Mongolia drop to -30 C (-22F) and below (US State Department). These harsh conditions make it very difficult for a herder to continually move their animals, giving them access to food. During heavy snow falls yaks are even used for herding because they have much greater mobility in deep snow than horses do. Herder's will ride them, usually using a horse saddle, to drive their animals to new pastureland.

It is clear that the yak plays a vital role in the survival of the nomadic herders contributing greatly to their meat and dairy intensive diet, providing them with rope, and aiding in transportation work. Because these animals play such an important role, it is important to understand how they are breed and selected.

Cattle Breeding

Products from the yak play a vital role in the survival of the nomads of central Mongolia. In order to ensure the quality of their cattle, nomads have a set of criteria used when selecting the father animals of their herd. Practices vary based on regional differences, but in my field locations herders gave almost identical criteria for selecting bulls. Therefore I won't cite individual interviews.

Before explaining the breeding process, the seasonal activities of the yak bull must be explained. During the winter the bull lives independently, foraging for their own food in the forested mountains. The Khangai Mountains provide protection from heavy snowfalls, allowing the bulls to graze in mountain pastures. During this time not only must the bull find its own food, but also protect itself from any predators. Bulls are large animals. One herder told me that the meat alone would weigh around 400 kg (880lbs), and there aren't many predators native to Mongolia that would be able to take on an animal this size. Regardless hungry wolves will still attack bulls. To defend themselves the bulls employ two tactics. The first is simply to lie down. The bulls hide is too strong for a wolf's claws or canines to penetrate. So long as the bull is patient, he will be left unharmed. If the bull rises, the wolf will attack their weak spot- those special organs that the bull, unlike the other male members of the herd, still has. If a group of bulls are encountered by a wolf, or pack of wolves, the second tactic is employed. The bulls will stand in a circle, with their hind quarters touching each other, forming an impenetrable mass of fir and hide. After hearing about how bulls defend themselves from wolves from several herders, I inquired as to how they knew these things. Had they ever seen it? The response was always no, but they had observed bulls using these tactics in response to the herders efforts to bring them down from the mountains in the spring and summer, to breed with their cows.

Herders go and retrieve their bulls from the mountains, bringing them to roam amongst their herds in the spring and summer. Some herders will bring them between May and June for breeding. Since the bulls have spent the winter without

any human contact, the herders have to go out and find them. During this time, neighboring herders will often be asking each other if they have seen any of the bulls or their own bulls. They will often go out into the mountains, scanning the topography with their binoculars for any signs of the animals. Communal knowledge is key in finding the bulls.

A vast majority of the herders I interviewed told me that there was no system to breeding. Even if they had more than one bull, they would simply bring them in amongst the herds, allowing them to impregnate the cows. The only exception I came across was from a herder who owned just one bull. He would tie his bull to a poll after it had impregnated the cows, not allowing it to impregnate them twice. The consensus amongst herders was that one bull could impregnate about 60 cows. The ideal number, to maintain healthy genetic diversity, is around 15. The bulls will naturally roam with their herd until October or November, when they leave again to find better pasture in the mountains.

Occasionally the bulls from one herd will find its way into another herd. The Mongolian steppe is almost entirely devoid of any fences, which occasionally causes one herder's animals to get mixed up with another's. Herders are alerted to these situations by the grunting and snorting that often emanates from bulls when they are chasing cows from a herd that's not their own. To remedy this situation herders will have to chase the bull away.

Herders in Bulgon Sum use bulls from their own herds along with ones that they purchase from other aimags. They will generally use a bull for breeding for 3 to 4 years, rotating between bulls raised from their own herds and ones they have

purchased. I this way they ensure that there is no inbreeding, and that they maintain a wide breadth of genetics.

Selection of Bulls

Herders use a variety of criteria to select bulls. The herders of Mongolia rely on their animals for food, and income. They are an integral piece of their survival, and therefore they know there animals extremely well. As previously mentioned, calves are born in the spring. If a herder wants to choose a bull from this group of calves, they will watch all of the calves very closely in order to select the best one. The process of selection starts immediately after the calves are born. They pay attention to their interactions with other calves, the relationship between the calf and its mother, and their growth rate and body structure.

The mother cow should be a larger animal with lots of fat and thick wool that covers the whole body. Another important factor is the quantity of milk they produce. During the daily milking the herders will examine how much milk each cow gives. The strongest calves will come from mothers who give the most milk. Every herder that I interviewed mentioned the same characteristics for a quality mother cow. These include a big build, high milk production, and thick wool that covers the entire body.

The herders also look for bulls that have calm temperaments, because aggressive bulls are more likely to chase cows from other herds, and injure calves within their own herd. By observing the interactions between the calves, herders gain insight into the character of the animals. Herders look for calves that don't butt or charge other calves and generally mild mannered animals.

The color and quality of hair is also extremely important. The hair must cover the entire body of the animal; otherwise they won't survive the harsh winters roaming alone in the mountains. The consensus among herders in Bulgon Sum was that brown and black were the best colors for yak bulls. A majority of the herders stated that brown is the best color. When I inquired as to why, I was told that animals of this color have thicker hair, and larger builds than others.

The other important piece of bull selection is body structure. Every herder mentioned that a larger bull is better, because it provides more meat than other animals, but the overall form of the animal also contributes greatly. The *servee* is the neck and upper part of the back. The *servee* should be tall and curved. The neck should be thick, and stocky. The shoulders should be broad so that the front and hind legs sit wide, as opposed to being tucked in. The hooves should also be large (Figure 3).These are the body traits that a mature bull should exhibit. Herders look for these qualities when choosing potential bulls from calves.

Figure 3: Yak bull photographed in the Khangai Mountains, near Bulgon Sum, Arkhangai Aimag

They observe the calves for the first year of their life, looking at their temperament and relationship with their mother, while also imagining what there body form will look like as they grow. At the age of two, all the calves, except for the future bulls, are castrated. During my stay in Bulgon Sum, I observed this process. The 2 year old calves are held down, while the herder makes a small incision, and then squeezes out the testicles one at a time. Each one is pulled out and the connection is cut. Then the herder spits on the wound and gives it a firm squeeze.

When purchasing animals from other areas, herders examine the form of bull and inquire about the mother and father. Often bulls are purchased at a young age (around 2 or 3 years old), but sometimes older bulls are purchased (around 6 or 7). Bulls will usually live to be 15 or 16, but have been known to survive until the age of 20.

Herding

During my time spent in Galuut Sum, Bayankhongor Aimag I learned about how yaks are herded. In the morning, after the cows had been milked, the herd would roam into the steppe. Some days my family would drive the cattle to a stream to the north for water, and others they would simply allow them to roam unguided. During the day whoever was free would ride out and search for the yaks with binoculars, just to make sure they were all right and keep tabs on their location. In the evening, whoever was free would go and collect the cattle and herd them to camp for the night. This is how yaks are herded during the spring, summer

and fall. Through my interviews I was able to gather some information about the herding practices during the winters.

In the winter the herders of Bulgon Sum herd their yaks into the protected forested areas where there is less snow, and often better pasture. According to the herders I interviewed, the number one reason for cattle loss was harsh winter climates, or *dud*. Snow greatly reduces the mobility of animals making it difficult to drive cattle in an organized fashion. Herders will often use a sling, made from yak leather to assist in herding in the winter. This tool flings rocks, scaring the yaks and causing them to run together. A herder in Bulgon Sum mentioned that a skilled herder can pick out a stray yak and hit it with a stone causing it to return to the herd, all while on horseback. This sling is also mentioned in the stories that I gathered during my field research.

Oral History

Domestication of the Yak: A story told by B. Delger:

> Deep in the Khangai Mountains rests a sacred mountain. The rolling peaks reach high into the sky, butting up against the earth-heaven border. Atop the mountain, a herd of wild yaks grazes, releasing low bellows of satisfaction as they chew on the green grass. Above, in the land of the sky, the creator is asleep. The resonating grunts travel up into the heavens and awake the creator. The creator is annoyed and tries to ignore the sounds and return to his slumber, but once again he is awoken by the grunts of the yaks below. The creator can stand it no more, and rises. He grabs his leather sling and charges towards the mountain. Upon seeing the yaks, he swings the sling over his head several times and releases, hurling a rock towards the annoying animals. “Shwiiing” goes the rock as it cuts through the air. The piercing sound startles the wild animals and they charge down the mountain, the creator chasing after them.

In this story the wild yak resides near the heavens, high up in the mountains. This could speak to the herder's perspective of the yak as a gift from the creator; one that is extremely useful and contributes greatly to their survival on the steppe. This is more evidence of the deep respect that herders have for these animals.

A story by D. Ulziibat:

There once was a man who lived in Arkhangai Aimag to the north of Bulgon Sum, near the shores of a wide lake. He was a wealthy man, with lots animals, and a large *ger*. But during a shift in government, he lost almost all his possessions and was left with only a few animals. The poor man's animals were getting weak and he was struggling to survive. Then one day something miraculous happened. A large yak bull rose out of the green lake near his camp. Dripping wet, it came ashore to find his cows grazing in a nearby field. The bull ran in and amongst the cows. From that day foreword, the herder's animals grew fat and strong. They provided him with much milk and meat, and he once again became rich.

I inquired which governmental shift was referenced in this story. I was told that it happened during the collapse of the Manchu dynasty and the transition to a communist state during the 1920's, but this has no real bearing on the underlying message of the story. The bull acts as the main characters savior, making his animals strong, and healthy. In this story the bull symbolizes fertility, not merely in its ability to produce offspring, but furthermore in the accumulation of wealth. The fact that no material items like gold, or jewels, were directly mentioned in the story reveals the herder's ideal of wealth- having a large herd of fat and healthy animals.

Analysis

The yak is extremely important animal for the herders of the Khangai Mountains of Mongolia. They play an important role in the main necessities of survival. Their meat and diary provides herders with food. Rope from their hides plays an important role in the internal structure of their dwellings. Furthermore they give the herder mobility by aiding in transportation. Food, shelter, and mobility are some of the core principles upon which nomadic pastoralists survive, and the yak contributes to all of these. I asked one herder which was the most important animal of all the animals they herded. They replied that all animals are important and play a specific role, but a herder can not survive without his cattle. One can live without sheep, goats, and horses, but you must have cattle.

The bull, more than any other animal, determines the quality of an individuals herd. All of the genetic material from one herd comes from the bull. The importance of the bull can even be seen in the story of the poor man, told by D. Ulziibat. After the bull chases his cows, all of his animals grew strong and fat and he was once again rich. In this case the bull caused the shift, almost as if it was a miracle. The bull is a key piece of the nomadic system, and herders have a special respect for these animals because of their impact on their herds. There is also some mystery that surrounds the yak bull. They roam away from humans, fending for themselves for six months of the year. During this time of year herders don't spend any of their time or energy devoted to the yak bull, and yet they depend greatly on their survival. Interestingly, I never came across a single herder who had lost a bull over a winter. One herder from Galuut Sum, Bayankhongor Aimag mentioned bulls

returning in the spring with injuries, but they were never fatal. This notion of independence is something that herder's value in their animals. So if these animals are so crucial to the survival of an a herd, and are deeply respected, why is there not a more formal way in which they are selected?

Herders in the field research areas investigated were not selecting their cattle to produce the most meat possible, or dairy, or the best leather products. They were selecting them for all of these criteria at once. That is why the system exists the way it does. There are no measurements taken of the calves, or indexes examined before a bull is purchased. Instead these herders are selecting animals that will produce healthy, strong offspring that can be used for many different things. According to Professor Dabaaxyy, at the Agricultural University, this is currently the case in most of Mongolia, but this may change. This university is setting up programs in every *aimag* with the goal of teaching herders to improve their livestock breeds. These programs are aimed at specializing the livestock herds. In order to help herders compete in the free market, they envision a transition to herds specialized in only diary, or meat, or hide. The goal of these programs is to keep the current lifestyle of the herders intact, while increasing their productivity.

In all of my interviews, I was told that there had been no serious changes in herding techniques throughout the lifespan of the herder. The core principles of hide, diary, and meat usage are the same. The techniques that are used to make rope are the same. The way that the animals are slaughtered and butchered is the same. The process of selecting a bull is exactly the same. The core principles behind this system are based on subsistence, not profit. The nomadic herders of Mongolia live

an extremely resilient lifestyle and they have been through several transitions in government. Surviving through drastic changes comes from the core foundation of the nomadic system, which is fundamentally sustainable and can be applied in many different environments. This may change in the future due to the influences of the free market. If herders become more specialized, and raise there cattle to produce only dairy, or meat, their system will become more profit based than it currently is. Ultimately this will change the lifestyles of the herders. They may very well be nomadic, but they will be buying probably be buying more products for their own diet. And ultimately it may become more efficient to move to a more sedentary system.

Cultural Connections

Herders live with their animals almost every day of the year, caring for them, driving them to new pastures. In the open steppe, where there are no fences and corrals keeping one herd separate from another, herders must be able to recognize individual animals, if they ever roam amongst another herd. Herders have a deep rooted connection with their animals that spans beyond just the obvious practicality of them.

The way in which yaks are herded provides a window into the herder's perception of their surroundings. When a herder rides out in search of his cattle, there are no guarantees that they will be in one place. They often have to search. One would think that this would add some level of stress, or worry to the occupation, but in my observations this does not exist in the slightest. This lack of structure has a deeper connection to the herder's perception of time. There are

certainly right and wrong times to do things, for example the castration of calves is dictated by the lunar calendar. But there is no need to truly structure past or present. Almost every herder that I interviewed struggled with remembering the month, and date, and sometimes even the year, when being asked to sign and date the informant consent form. These observations do not span a wide enough scope to prove anything, but they still give a glimpse into the herder's perception of time.

Herders also depend greatly on the mother-offspring relationship between yak cows and their calves. This relationship is observed in great detail when selecting a potential bull. I noticed that I would often hear herders saying *eej*, meaning mother, when they would bring calves from the pen to their respective cows during the morning milking. I believe the importance of this relationship parallels the herder's perception of the mother as the most important force in a young child's life. It may be a stretch to suggest that human relationships are affected by the animals that they manipulate for food and income, but it would also be ridiculous to claim that the animals they spend every day with have no affect of them at all. After all, we are all animals ourselves, many of us are simply to far removed from nature to accept it.

Conclusion

For the nomadic herders of the Khangai Mountains in Mongolia, the yak plays an integral role in their survival by providing them with milk, meat, rope, and aiding in transportation and every day activities. Because of the importance of these animals there is a set of criteria that herders use to select these animals. This is based not only on body form, but also the mother-calf relationship, and demeanor

of the animal. Herders seem to have a sixth sense enabling them to imagine the future body structure of a potential bull. This is acquired through observation, and teachings from their parents. Through examination of the importance of these animals, we can also gain a deeper understanding of the connections between herders and their animals. Everywhere one looks within the lifestyle of Mongolian nomads, an infinite level of complexity can be found. When you probe one topic, connections with another arise. There is still much to be learned from the vast knowledge of the nomads.

Glossary of Terms

Ail: one camp of herders who live and work together, usually consisting of 2-3 families

Aimag: A Mongolian province. The country is divided into 21 aimags

Alt: measuring unit equivalent to the average human wingspan.

Ger: a felt covered yert or tent like structure that Mongolian nomads live in throughout the year

Buuz: steamed meat dumpling dish that's very popular in Mongolia

Un: upper rafters of a ger that radiate out from the central circular window

Khashaa: term for fence or corral

Mara: a salty powder often used for encouraging mother yak cows to accept their calf's

Shar: steer, or castrated male yak that is often used for work and carrying loads

Haineg: a bovine that

Dzud: harsh winter climate, often resulting in cattle loss

Tenger: Mongolian word for sky, and heaven

Borts: dried meat

Eej: Mongolian word for mother

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